Fabrication Tips For ChromaLuxe & Unisub Substrate Sheetstock

By: David Gross, Keith Shifflett and Sara Nicholson

CONDÉ®

ChromaLuxe®

unisub®

Overview

- Many sublimators want to create their own special products and ask for tips on how to fabricate the substrates that make Unisub and ChromaLuxe products.

Sheetstock Dos and Don’ts

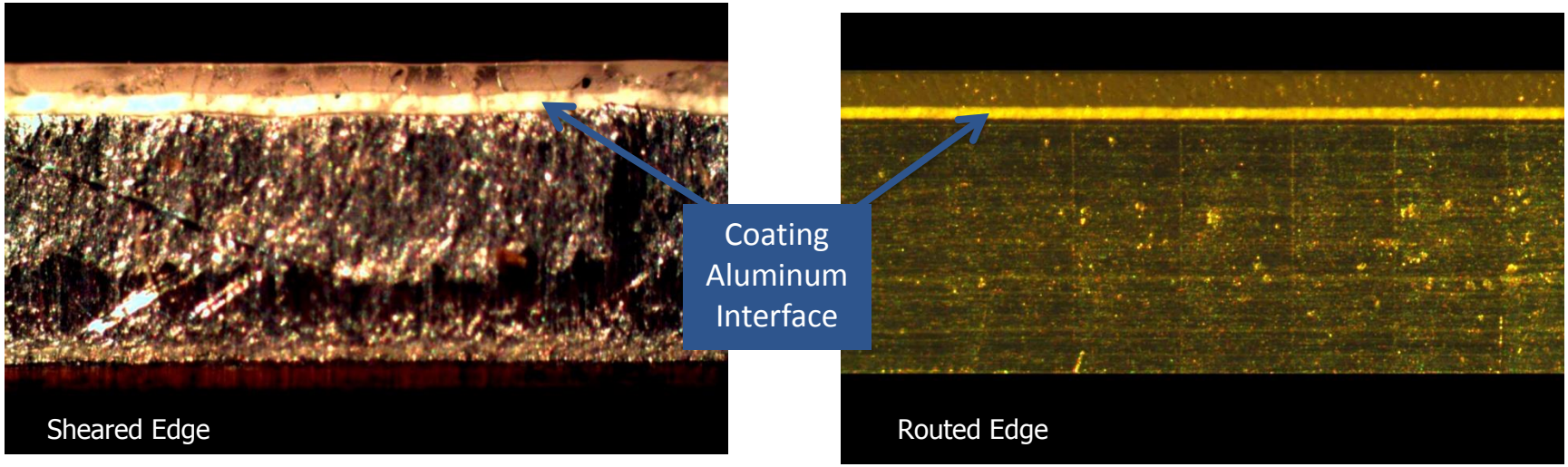
- DO
  - Saw cut, chamfer sand, frame, rout, laser edges.
- DO NOT
  - Do not use 49x97 or case packed sheetstock edges as a products finished edge
  - Do not calculate yield using a sheet’s edge - view it as a perimeter trim
- DO NOT
  - Sell or consider sheetstock to be a finished product, it isn’t, rather, a blank to make a product out of

Why Sheetstock is not a finished product

- Sheetstock is either panel saw cut or sheared
- This results in micro-chipped edges that will chip

Physical Changes with Sublimation

Shearing vs. Routing



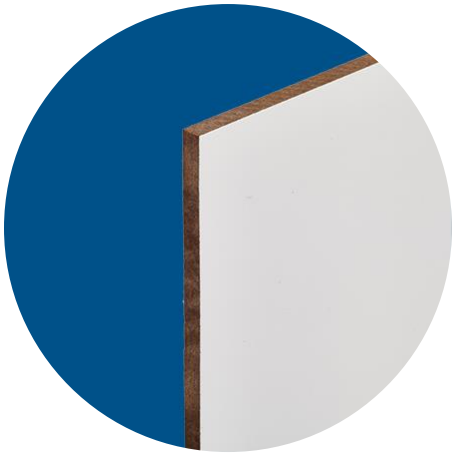
Here is a look at two panels magnified 80x
- This shows the difference between the edge of a sheared panel as opposed to that of a routed.
-When heated, the expansion of the metal and the resistance of the coating will give a much greater chance for chipping issues with sheared material.

CONDÉ®

unisub®
ChromaLuxe®

Hardboard

Aka High Density Fiberboard (HDF)



HDF/HB is a type of fiberboard, an engineered wood product.

- Similar to particle board and medium-density fiberboard
- Denser, stronger, and harder
- Made out of exploded wood fibers that have been highly compressed

Hardboard Products

- A brand name is Masonite
- Products from Hardboard
  - Clipboards
  - Coasters
  - Placemats
  - Clock faces

Hardboard Sheetstock

- #10124 Case Pack Sheetstock 15.5”x18.5”
- 5610 1/8” Hardboard 48x96 sheetstock
- 7154 ¼” Hardboard 48x96 sheetstock
- 5889 ChromaLuxe Gloss White/Black back, clear/green film

Fabricating Hardboard

Saws

- Conventional carbide tipped woodworking saw blades work well.
- It can also be cut on tabletop safety saws using smaller diameter, multiple tooth blades.
- Chamfer sand edges if exposed or frame out

Laser Engravers

- Cuts well with 25-watt system; faster with 50-watt
- We use 250 Watt machines and run between 110-130 inches per minute for ¼”.
- We see some power variations over the cutting area and depending on the direction of the cut.

CONDÉ

unisub
ChromaLuxe®

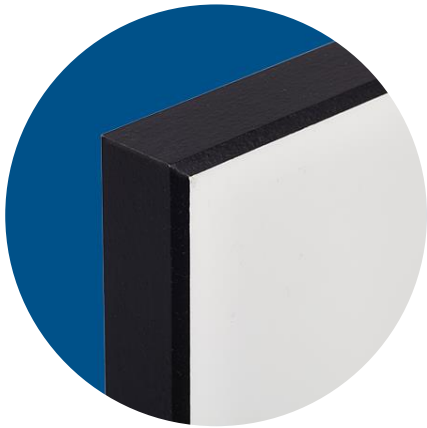
Routing

- A bull-nose or slightly rounded profile is suggested for all hardboard that has been straight cut with a saw, as the edges are very vulnerable to damage and chipping.
- However, this isn’t necessary for laser cut items as the edge generated by the heat “seals” the paper fibers.
  - Example - look at a Unisub Tile edges – these were cut on a 1,000-watt laser.

Hardboard Do Nots

- ¼” Hardboard Sheetstock #7154 cannot be routed, only saw or laser
- Shears are not recommended for hardboard

Medium Density Fiberboard (MDF)49"x 97"



- MDF is an engineered wood product made by breaking down hardwood or softwood residuals into wood fibers.
- This often happens in a defibrator (pulping refiner), combining it with wax and a resin binder, and forming panels by applying high temperature and pressure.
- MDF is generally denser than plywood.

CONDÉ®

unisub®
ChromaLuxe®

MDF Based Products

- Unisub Plaques
- ChromaLuxe Plaques
- Coat Hangers

CONDÉ®

unisub®
ChromaLuxe®

MDF Sheetstock Products

- 5614 .625 Unisub Gloss White/Black Back, red film 1
- 7155 .75 Unisub Gloss White/Black Back, red film 1
- 5888 .625 ChromaLuxe Gloss White/Black back, red film 1

Fabricating MDF

- SAWS – conventional carbide tipped woodworking saw blades work well.
- Saw cut works best with stacked or booked sheets
- LASER ENGRAVERS – cuts OK with 35-watt system, but 100 watt recommended.
- SHEARERS- not recommended.

ChromaLuxe Matte Clear Maple (0.625)

MDF Core, Maple Veneer Face with unfinished back

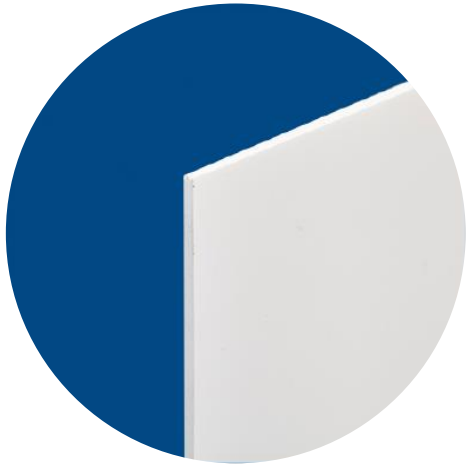
4527 0.625 ChromaLuxe Matte Clear Maple, blue film , 49" x 97"

Fabricates same as .625 MDF UN Gloss White with black back

CONDÉ®

unisub® ChromaLuxe®

Fiberglass Reinforced Plastic .09 (FRP)



- A white composite material made of a polymer matrix reinforced with fiberglass strands that keeps the plastic rigid when heated to 400 degrees.
- Fiberglass reinforced panels are used on walls and ceilings, installing it directly over solid surfaces.
- FRP provides a durable, scratch resistant surface, easy to clean panel and provides superior moisture resistance.

FRP Based Products

Bag tags, name badges, door hangers, etc.

CONDÉ®

unisub®
ChromaLuxe®

FRP Products

5513 UN Gloss White FRP SHEETSTOCK 1 SIDED 11.5" x 23.25" case pack 10
5528 UN Gloss White FRP SHEETSTOCK 2 SIDED 11.5" x 23.25" case pack 10
5529 UN Matte White FRP SHEETSTOCK 1 SIDED 11.5" x 23.25" case pack 10
5534 UN Matte White FRP SHEETSTOCK 2 SIDED 11.5" x 23.25" case pack 10
5537 UN Gloss White FRP SHEETSTOCK 1 SIDED 23.25" x 23.25" pallet packed 10
5538 UN Gloss White FRP SHEETSTOCK 2 SIDED 23.25" x 23.25" pallet packed 10
5535 UN Matte White FRP SHEETSTOCK 1 SIDED 23.25" x 23.25‟ pallet packed 10

49" x 97"
5608 Unisub Gloss White 1S, clear film 1
5609 Unisub Matte White 1S, blue film 1
9100 Unisub Gloss White 2S, clear film 2, 3 week LT
9100 Unisub Matte White 2S, blue film 2, 3 week LT

Fabricating FRP

.090 nominal, +/- .015 thickness tolerance.

SAWS – same as hardboard.

ROUTERS – solid carbide 2 - flute straight cutter. A bull-nose or slightly rounded profile is suggested on (FRP) that has been cut with a saw or router as the edges are vulnerable to chipping. This would not be necessary for parts whose edges are covered or encapsulated (i.e. desk name plate that slides into a frame).

LASER ENGRAVERS – not recommended.

Antares Tooling for Sheet Stock

(Antares is a company name 800 355 5250).

- Use a quarter round tools with profiling angles for a 15-degree bevel that will provide the clearance needed for Unisub.
- An ADA Cut-Out Letter tool may be used if a steeper bevel is desired.

Antares Tooling for Sheet Stock

(Antares is a company name 800 355 5250).

- The addition of the Antare's "Clean-Cut" tool or bit has a clearance that will provide the best results.
- Use a tool with a tip size of at least .060 ". Good results have been obtained using a .100 "tip.

SHEARERS – not recommended for FRP.

CONDÉ®

unisub®
ChromaLuxe®

Industrial Router Specs:

CNC routing Unisub one-sided and two-sided FRP (and Hardboard products)

- Use a 2-flute carbide router bit with a Downward spiral cut at a feed rate of 30 – 50 IPM.
- 30 IPM is on smaller parts, while 50 IPM on parts larger than 4” square.
- Routers spin at 18000 RPM
- Provides a bull-nosed or slightly rounded edge profile (like a clipboard’s edge)

SHEARERS – not recommended for FRP.

CONDÉ®

unisub® ChromaLuxe®

Industrial Router Specs:

- Can use Onsrud (http://www.onsrud.com/) brand bit
- Carbide bits are better than diamond bits – they're sharper providing a smoother edge. These two benefits outweigh its shorter life.
- We buy longer Carbide bits - 4" - for re-sharpening. When you can't re-sharpen it anymore, cut it off and start again.

SHEARERS – not recommended for FRP.

CONDÉ®

unisub®
ChromaLuxe®

Aluminum (.03 & .045)

Unisub and ChromaLuxe

There are several options for creating a finished look to ChromaLuxe aluminum, shearing, routing, saw cutting, and sanding the edge.

CONDÉ®

unisub® ChromaLuxe®

Aluminum Sheetstock Products

49x97 Sheetstock purchases require a minimum 10 sheet purchase

5613 Unisub Gloss White 1S, clear film 10.03

5883 ChromaLuxe Gloss White 1S, clear film 1 0.045
5943 ChromaLuxe Gloss Clear, 1S, clear film 1
5968 ChromaLuxe Matte Clear, 1S, blue film 1
5969 ChromaLuxe Matte White, 1S, blue film 1
4563 ChromaLuxe Semi-Gloss White 1S, orange film 1
4577 ChromaLuxe Semi-Gloss Clear 1S, orange film 1

4749 ChromaLuxe EXT Gloss White 1S, yellow film 1

Aluminum Sheetstock

4284 SHEETSTOCK – ALUMINUM CL Gloss Clear 12" x 24" case pack 10
4570 SHEETSTOCK – ALUMINUM UN Gloss Clear 12" x 24"
5570 SHEETSTOCK – ALUMINUM UN Gloss White 12" x 24"
5623 SHEETSTOCK – ALUMINUM CL Gloss White2" x 24"
4285 SHEETSTOCK – ALUMINUM CL Matte Clear 12" x 24"
4283 SHEETSTOCK – ALUMINUM CL Matte White 12" x 24"
4658 SHEETSTOCK – ALUMINUM CL SG Clear 12" x 24"
4657 SHEETSTOCK – ALUMINUM CL SG White 12" x 24"
5629 SHEETSTOCK – ALUMINUM UN Gloss White 23.25" x 47" pallet pack 10

Fabricating Aluminum

Shearing:

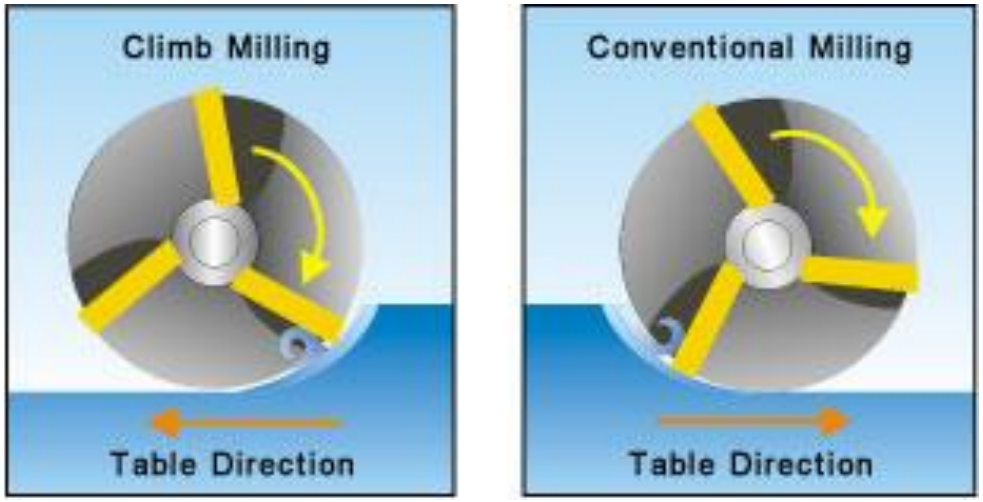
- Want to keep the shear blade gap under 0.003”
- Blades need to be sharp and free of anything stuck to them - essentially, like it was factory new
- Shearing coating side up

Sanding Edge:

- For the initial sanding, want to keep the block with sand paper at about a 45 degree angle
- After that you can smooth the edges with a side to side motion
- Suggest using sand paper in the 150-220 grit

Routing

- Equipment that we suggest is a Thermwood CNC router
- Use climb cutting and not conventional (climb, the cutter rotates with the feed; conventional, the cutter rotates against the direction of the feed while during)



Routing

- Equipment that we suggest is a Thermwood CNC router, but others use Multi-Cam, Zund
- It's important to have good vacuum to hold parts in place and to keep parts stabilized to minimize vibrations created with cutting
- Suggested tooling is an o-flute straight bit
- When using smaller diameter bits suggest single fluted tool
- When using larger diameter bits suggest using a double fluted tool

Routing

- Want to keep an eye on tool life and condition of router bits
- Feed-rate and spindle speed are subject to the equipment used, the tooling itself and material that it is made out of, as well as what material is being machined so this document does not suggest specific information for that
- Always send some ChromaLuxe to your CNC vendor for their specs how to rout it and you sublimate test and inspect edge results

Routing

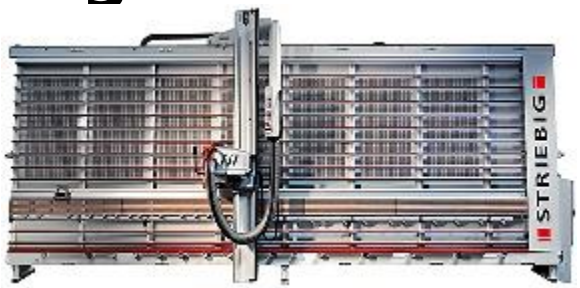
- 3/16 O-Flute tools from Onsrud (item # 65-061) work well.
- Cut through the material at 18,000 rpm.
- Feed rate varies from 50ipm-200ipm depending on the size and geometry of the panel
- Consider Onsrud 61-061 bits for smaller parts and Onsrud 56-650 for larger.

Routing

- Again, good hold-down is extremely important with our material.
  - Flat MDF boards can work if there's strong enough vacuum but it's not always sufficient.
  - Consider 1/32 thick rubber gasket on top of MDF and then drill holes to let the vacuum through.
  - The rubber reduces vibration and supports the aluminum out to the edges."

Saw Cutting:

- Equipment we suggest is a Striebig compact saw, but we know of labs using ones that cut acrylic
- It's important to keep the material stable and minimize the vibrations
- Suggested tooling is a 100 tooth saw blade designed for aluminum
- **Have to sand the edges**



CONDÉ®

unisub®
ChromaLuxe®

.023 Steel 48”x96”

- Steel is magnetic and the choice for small and large format personalized dry erase panels
- It’s value set of dry erase and being sublimatable is vastly superior to baked paint, vinyl surfaced materials, and less expensive than ceramic steel

Location:	Atascocita Springs Elementary School, Humble TX	**Printer:**	Digital Designed Solutions
Substrate:	Steel, Dry Erase Boards	**Architect:**	PBK

CONDÉ®

unisub®
ChromaLuxe®

Steel Sheetstock

5960 SHEETSTOCK - STEEL UN Gloss White DRY ERASE 11.875“x23.875“ 10/cs
5961 SHEETSTOCK - STEEL UN Gloss White DRY ERASE 23.875“x47.875“

6888 Steel Digital UniRase Gloss White 1S, yellow film 48”x96”

Fabricating Steel

Shearing:

- Want to keep the shear blade gap under 0.003”
- Blades need to be sharp and free of anything stuck to them
- Shearing coating side up

Fabricating Steel

MUST sand edge:

- For the initial sanding, want to keep the block with sand paper at about a 45 degree angle
- After that you can smooth the edges with a side to side motion
- Suggest using sand paper in the 150-220 grit

- OR
- Frame

Cannot rout or saw cut steel


CONDÉ®


unisub®


ChromaLuxe®